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modified while passing through the throat and mouth. The resonance effect is dependent upon factors such as the position of the jaw and tongue. Speech is produced by independently controlling and changing the vocal chords (the original signal) and the vocal tract (the resonator) to change the fundamental frequency of the original signal (the pitch) and the formant frequencies of the resonant signal (the pronunciation). The claimed invention produces an audio segment by processing the pitch of residue segments in the absence of the formant, and subsequently adding the formant to the newly calculated residue segments. In other words, the component associated with pronunciation is removed for part of the calculation.

The Office rejected claims 1-31 under 35 U.S.C. §103(a) over Yeldener in view of Wang in further view of Roy. Yeldener shows in Fig. 2 and the accompanying text at Column 7, line 63-Col. 8, line 4 that a voice signal can be separated into components including pitch, voicing probability and spectrum band energy coefficients. Even assuming that those components are similar to the components described in this application, for which the Office has presented no supporting argument, there is no suggestion in Yeldener that a missing voice segment should be replaced by separating the formant from the residue in a nearby audio segment, processing that residue, and then reintroducing the formant. Wang and Roy teach generation of replacement packets, but not by operating on the residue alone and then reintroducing the formant. Hence, the result of the cited combination would be to employ linear predictors or some other calculation on all components of a voice signal. The result of such a combination could sound unnatural if the formant is significantly changed. In contrast, the presently claimed invention separates the pronunciation (formant) to operate on the residue of the voice signal in order to produce a more natural sound in the generated replacement audio segment.

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The distinguishing feature described above is recited in the claims. For example, Claim 1 distinguishes the cited combination by reciting “processing the pitch of the set of residue segments to produce a new set of residue segments; and adding the formant of the consecutive set of audio segments to the new set of residue segments to produce an output audio segment.” (emphasis added) Similarly, claim 11 distinguishes the cited combination by reciting program code for processing the pitch of the set of residue segments to produce a new set of residue segments and program code for adding the formant to the new set of residue segments to produce an output audio segment. Similarly, claim 21 distinguishes the cited combination by reciting a pitch detector calculating the pitch of the set of residue segments, an estimator producing a new set of residue segments based upon the set of residue segments and the calculated pitch, and an inverse filter adding the formant of the consecutive set of audio segments to the new set of residue segments to produce an output audio segment. Claims 2-10, 12-20, and 22-31 are independent claims which recite further distinguishing features. Applicant therefore requests that the rejections of claims 1-31 be withdrawn.

The rejections should also be withdrawn because there is no basis to combine the references. Because Applicants have previously made this argument, it will not be repeated in full in this Amendment. However, Applicants reassert that there is no basis to combine the references for the reasons stated in the previous response.

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Conclusion

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Holmes W. Anderson, Applicants' Attorney at 978-264-6664 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

Date


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